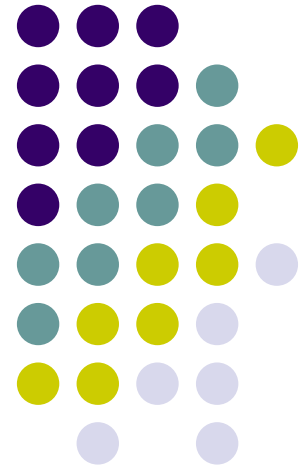
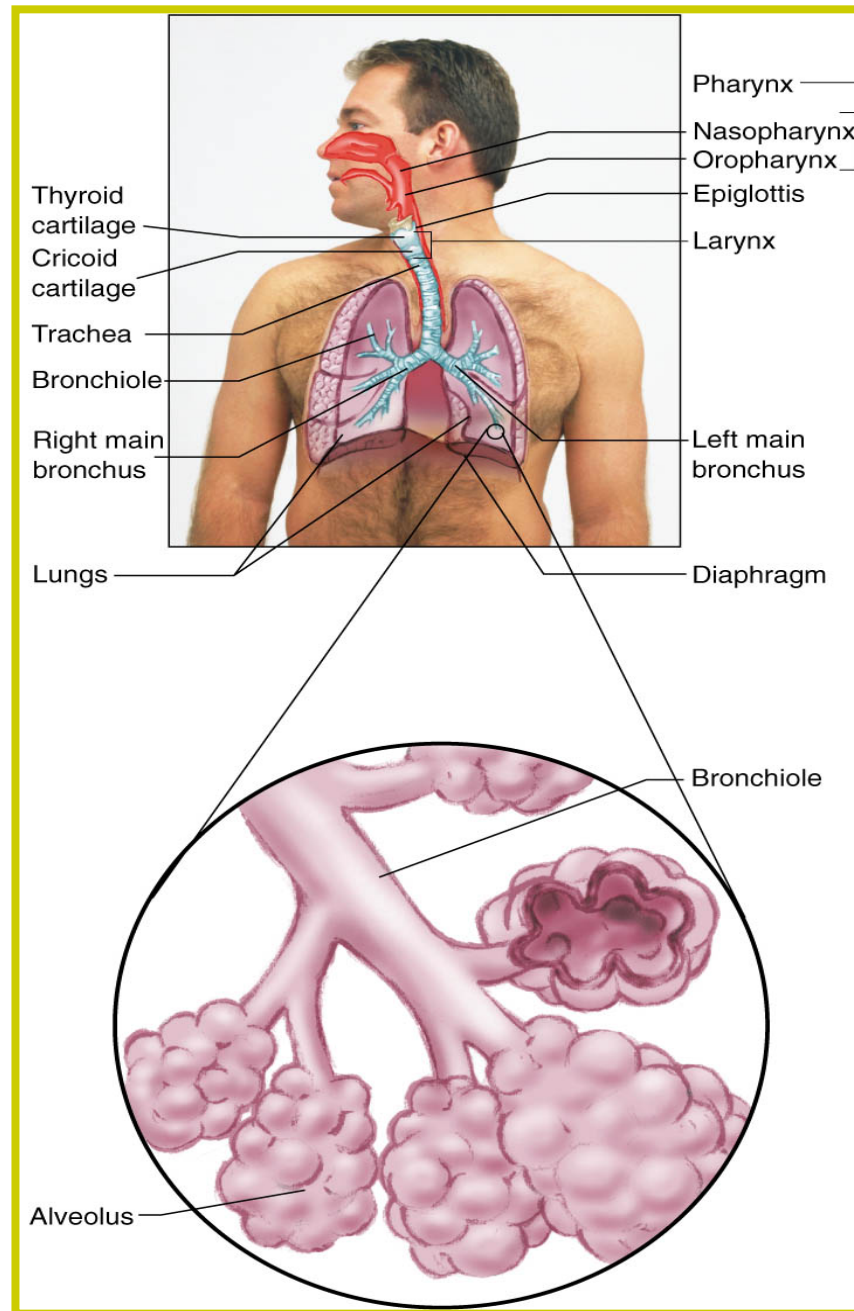


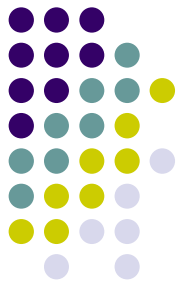
Nebraska Airway and Breathing

2002 Supplement



Airway Anatomy

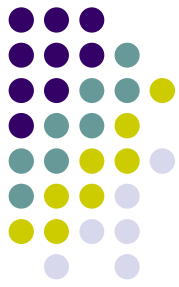




Airway Function

- Movement of air must be maintained!!
- **Rule 1. If you don't have an airway you don't have a patient—you have a cadaver**
- Easily blocked
- Partial blockage—complete blockage

Signs of Adequate Ventilatory status (breathing)



1. Normal Respiratory Rate
2. Rhythm
3. Quality
4. Depth (tidal volume)

Signs of inadequate ventilatory status (breathing)



- Agonal ventilation

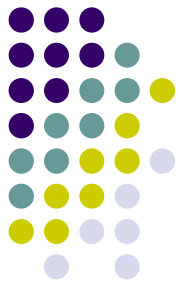
Patients exhibiting signs and symptoms of inadequate ventilation (breathing) must be considered to be experiencing respiratory distress.

Signs of inadequate ventilatory status (breathing)



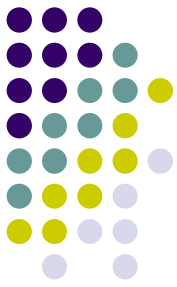
Quality

- Auscultated breath
- Reduced flow of expired air at the nose and mouth
- Chest expansion
- Increased effort of breathing – use of accessory muscles.



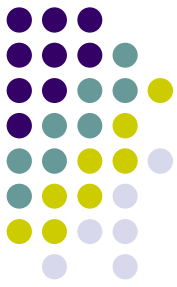
Breathing Difficulty

- Signs and symptoms
 - Shortness of breath
 - Increased work of breathing
 - Restlessness
 - Increased pulse rate
 - Increased ventilatory rate
 - Decreased ventilatory rate



Breathing Difficulty-Sounds

- Noisy Breathing-Sounds
 - Breathing Difficulty
 - Audible wheezing
 - Gurgling
 - Snoring
 - Stridor
 - <http://www.rale.ca/Recordings.htm>



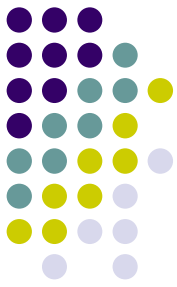
Breathing Difficulty

- Difficulty/Inability to speak
- use of accessory muscles.
- Decreased tidal volume
- Abdominal breathing
- Coughing
- Irregular breathing rhythm
- Patient position
- Skin color changes

Signs of inadequate ventilatory status (breathing)



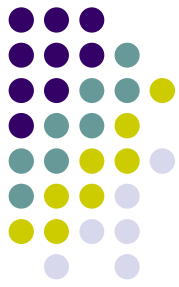
Rule 1. If you don't have an airway you don't have a patient—you have a cadaver!!!!



Opening an Airway

- Head tilt-Chin lift
- Jaw Thrust
- Suction
- Nasal pharyngeal airway
- Oral pharyngeal airway

Techniques for Opening the Airway

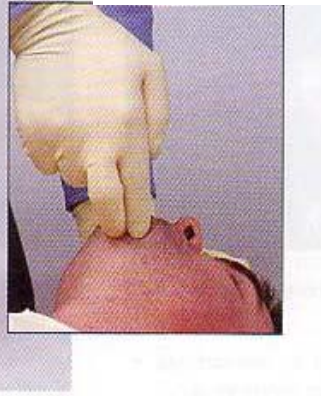


- Head Tilt-Chin-Lift Maneuver
- No matter what the patient condition, the airway must remain patent at all times –See rule 1
- Use of the Head-Tilt Chin-Lift Maneuver is temporary and must be replaced with an upper airway adjunct unless the patient begins adequate spontaneous ventilation.

Head Tilt Chin Lift



Place the fingers of your other hand under the bony part of the victim's lower jaw near the chin. Lift the jaw upward to bring the victim's chin forward and the teeth almost to occlusion



Place one hand on the victim's forehead and apply firm, backward pressure with the palm of your hand causing the head to tilt backward.

Jaw Thrust Maneuver

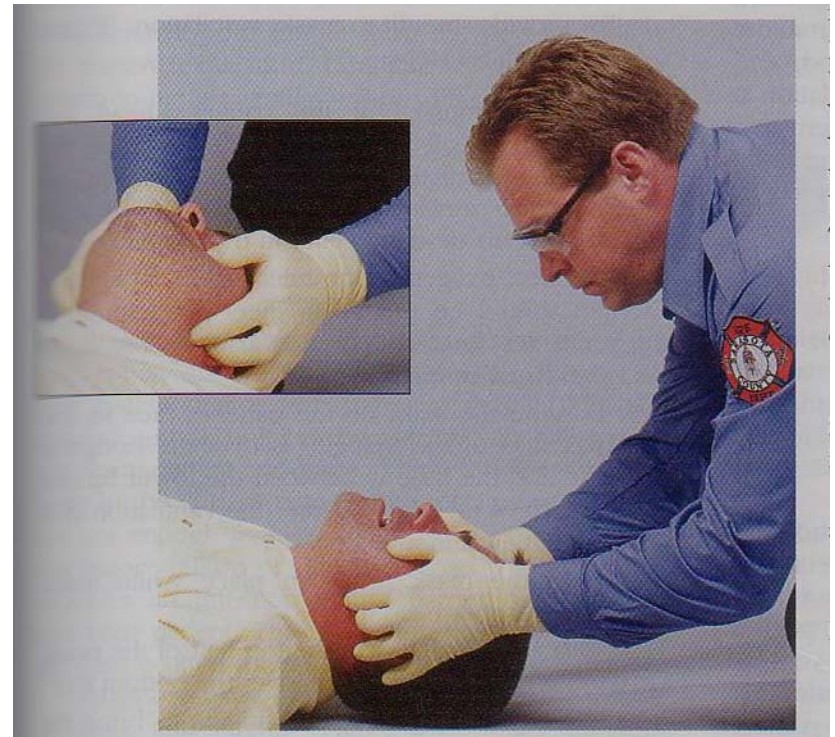


- Assess the need for the Jaw Thrust Maneuver
 - Used when EMT-Basic suspects spinal injury
 - Use of Jaw thrust is temporary and must be replaced with an upper airway adjunct (oral pharyngeal airway)
 - No matter what the patient condition, the airway must remain patent at all times. See Rule 1.

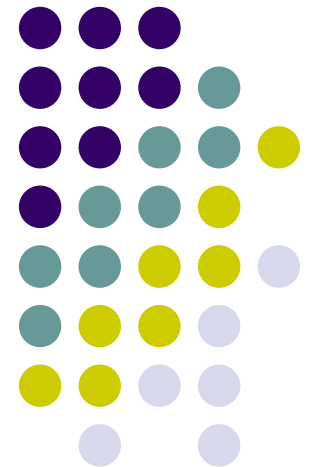
Jaw Thrust Maneuver Technique

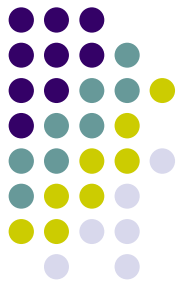


- Place one hand on each side of the victim's head
- Grasp the angles of the victim's lower jaw and lift with both hands
- If the victim's lips close, you can retract the lower lip with your thumbs



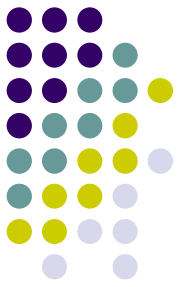
Clearing Airways





Techniques of Suctioning

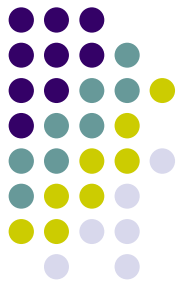
- 1. Body substance isolation
- 2. Purpose
 - a) Remove blood, other liquids and food particles from the airway.
 - b) Some suction units are inadequate for removing solid objects like teeth, foreign bodies and food.
 - c) A patient needs to be suctioned immediately when a gurgling sound is heard with artificial ventilation.
 - d) Suction devices may not be able to remove large obstructing particles in the airway.



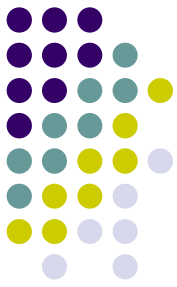
Types of Suction devices

- Mounted
- Portable
 - Electrical
 - Hand operated

Suction catheters



- Hard or rigid (“tonsil sucker,” “tonsil tip”)
- Soft (French)



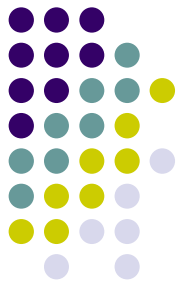
Techniques of use

- Suction device should be inspected on a regular basis:
 - before it is needed
 - 300 mmHg vacuum
 - A battery operated unit should have a charged battery.



Techniques of use

- Turn on the suction unit.
- Attach a catheter.
- Use rigid catheter when suctioning mouth of an infant or child.
- Often will need to suction nasal passages; should use a bulb suction or French catheter with low to medium suction.
- Insert the catheter into the oral cavity without suction, if possible. Insert only to the base of the tongue.
- Apply suction. Move the catheter tip side to side.
- Suction for no more than 15 seconds at a time.



Techniques of use

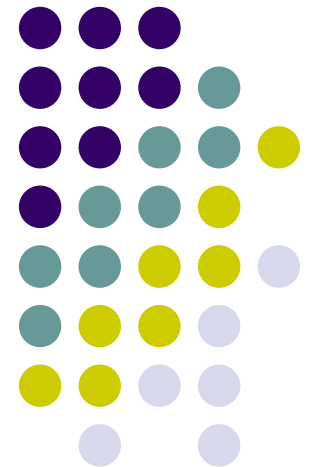
- In infants and children, shorter suction time should be used.
- If the patient has secretions or emesis that cannot be removed quickly and easily by suctioning, the patient should be log rolled and the oropharynx should be cleared.
- If patient produces frothy secretions as rapidly as suctioning can remove, suction for 15 seconds, artificially ventilate for two minutes, then suction for 15 seconds, and continue in that manner. Consult medical direction for this situation.
- If necessary, rinse the catheter and tubing with water to prevent obstruction of the tubing from dried material.

Assess the Need for Suctioning



- No matter what the patient condition, the airway must remain patent at all times. See Rule 1.
- Airway obstructions often needing suctioning

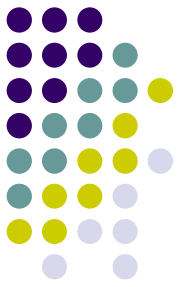
Airway Adjuncts



Airway Adjunct Types

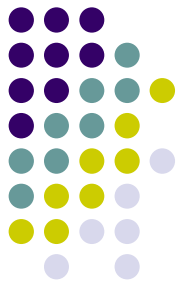
- Nasopharyngeal
- Oropharyngeal





Nasopharyngeal

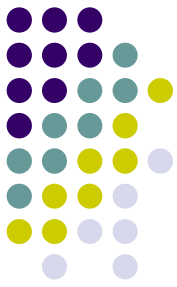
- Vomiting
- May be used on responsive patients
- Painful stimulus.



Nasopharyngeal

Assess the Need for Nasal Pharyngeal Airway

1. Place after opening the airway using a manually
2. Typical patients in need of nasopharyngeal airways
 - Unresponsive patients who are snoring
 - Unresponsive patients with a gag reflex



Nasopharyngeal

Technique

- Select the proper size
- Lubricate the airway
- Insert airway

Oropharyngeal



Assess the Need for Oral Pharyngeal Airway

- Placed after opening the airway using a manual maneuver
- allows the EMT to continue assessment and treatment
- Examples of patients needing oral pharyngeal airways
 - Unresponsive, apneic patients
 - Any apneic patient being ventilated with a BVM.

Oropharyngeal



May be used to assist in maintaining an open airway on unresponsive patients without a gag reflex.

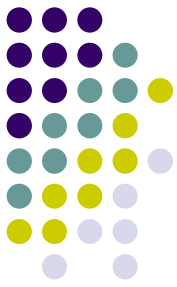
Patients with a gag reflex will vomit!

Oropharyngeal



Technique A

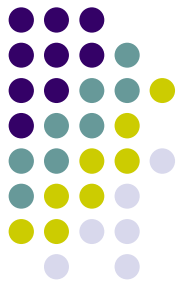
- Select the proper size
- Open the patient's mouth
- In adults, insert the airway upside down
- Advance the airway and Turn 180⁰



Oropharyngeal

Technique B

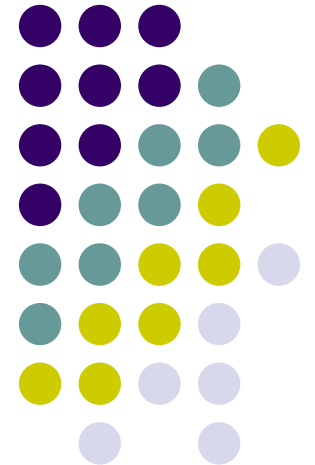
- Insert airway right side up
- Use a tongue depressor to press the tongue down and forward
- Preferred method for infant or child.

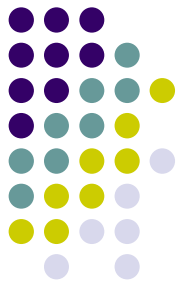


Other Advanced Airways

- All manual maneuvers and upper airway adjuncts have limitations!
- They are not definitive airway device
- Patients that vomit or have active bleeding in the airway must be frequently suctioned in order to maintain an open airway
- A definitive airway intervention, such as endotracheal intubation, protects the airway.

Ventilation

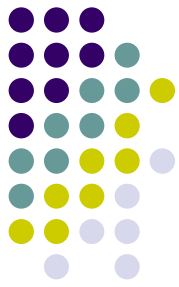




Techniques of Ventilation

In order of Preference

1. Mouth-to-mask with one-way-valve, oxygen inlet port and supplemental oxygen
2. Two-person bag-valve-mask with oxygen reservoir and supplemental oxygen
3. Flow restricted, oxygen-powered ventilation device (Manually triggered ventilator)
4. One-person bag-valve-mask with oxygen reservoir and supplemental oxygen



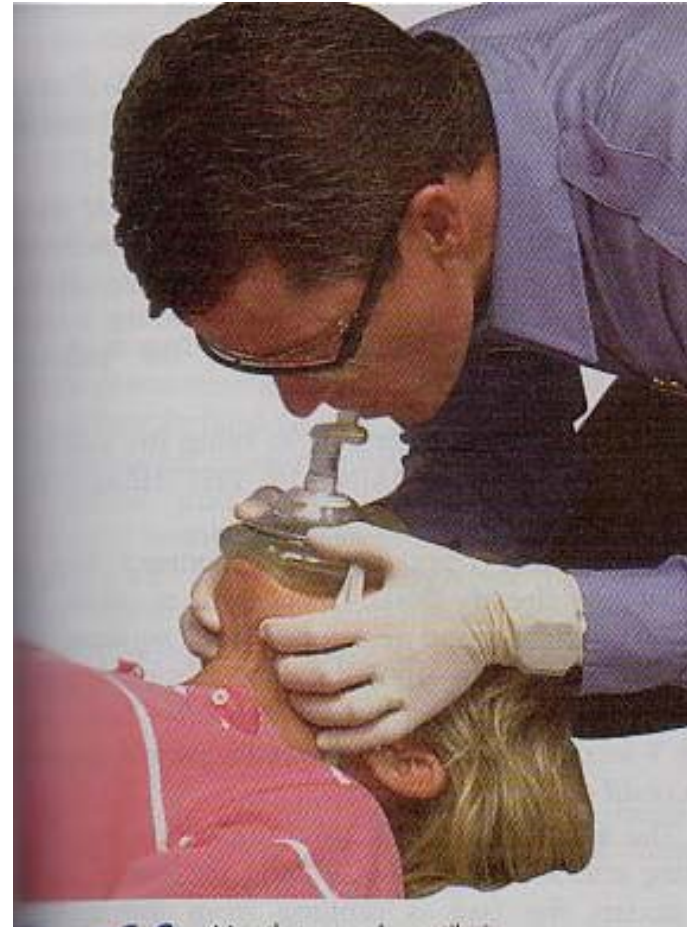
Mouth-to-mouth

- head-tilt chin-lift
- pinch the victims nose closed.
- Take a deep breath, seal your lips around the victim's mouth for an airtight seal
- Slowly blow your exhaled air into the victim's mouth (2 seconds)
- The victim's chest should rise with each breath.

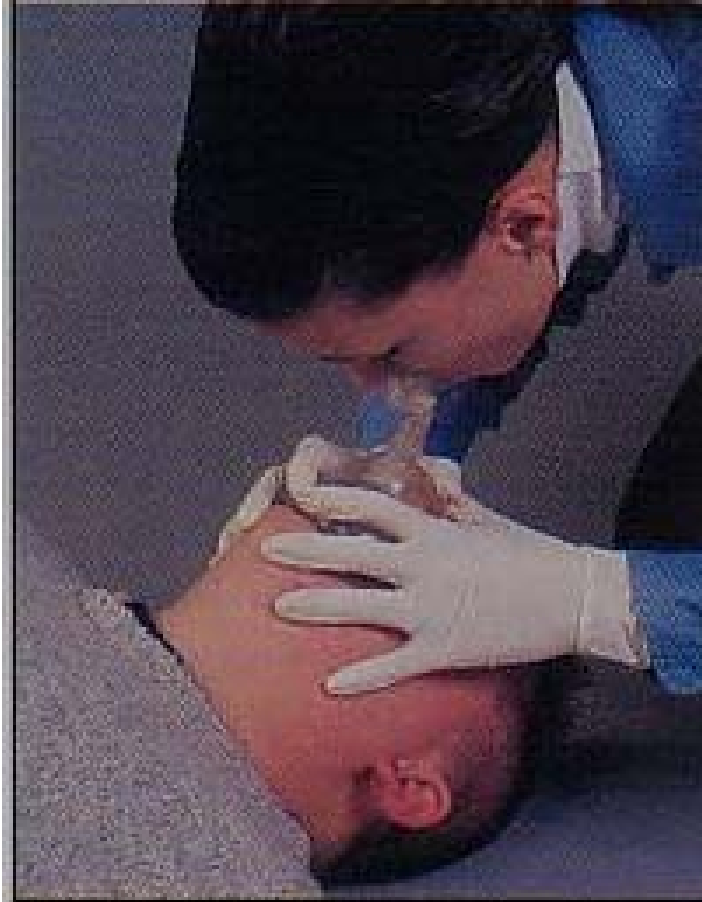


Mouth-to-mask Technique Method #1 (no suspected spine injury)

- Position yourself
- Apply mask to the face
- Place thumbs
- Place index fingers
- Lift the jaw into the mask
- Squeeze mask
- Breath



Mouth-to-mask Technique Method #2 (suspected spine injury)



- Position yourself
- Apply the mask to the victim's face
- Use the thumb and first finger of each hand
- Remaining fingers to lift the angle of the jaw
- Lift Jaw & Squeeze mask
- Breath

Mouth-to-mask Technique Method #3 (no suspected spine injury)

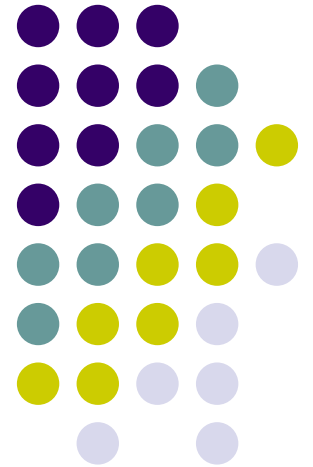


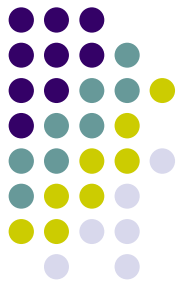
- Position yourself beside the victim's head
- Apply the mask
- Seal the mask
- Place your remaining fingers
- Lift the jaw
- Breath



Bag Valve Mask

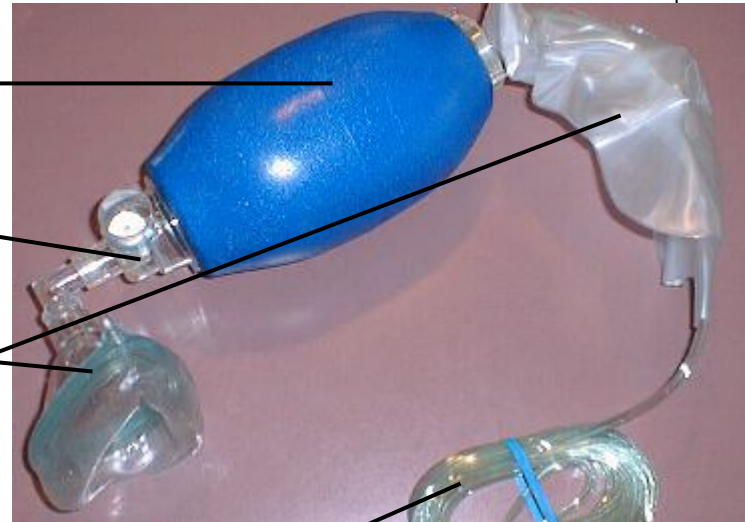
The BVM



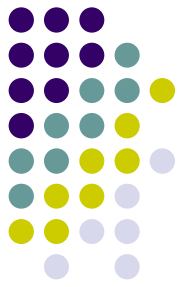


Bag Valve Mask

- Self-inflating bag
- One-way valve
- Face mask
- Oxygen reservoir

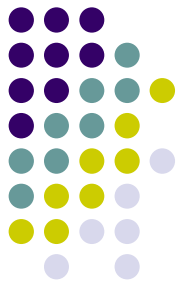


BVM needs to be connected to oxygen supply to perform most effectively.



Bag-valve-mask issues

- Volume approximately 1,600 milliliters
- Less volume than mouth-to-mask
- Airtight seal difficult for Single EMT
- Two EMTs will be more effective.
- Position self at top of patient's head
- Oral or nasal airways may be necessary

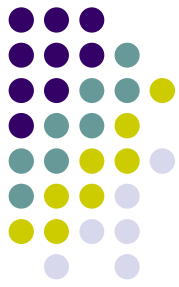


BVM Requirements

- Bag easily cleaned and sterilized.
- A non-jam valve
- Oxygen inlet flow of 15/lpm.
- No pop-off valve
- Standardized 15/22 mm fittings.
- An oxygen inlet and reservoir
- Should perform extremes.
- Available in infant, child and adult sizes.

Technique for use

No suspected trauma



- Open airway
- Insert oral or nasal airway
- Attach mask
- Position thumbs over top half of mask
- Index and middle fingers over bottom half
- Place apex of mask over bridge of nose
- Lower mask over mouth and upper chin
- Bring jaw up to mask

Technique for use

No suspected trauma

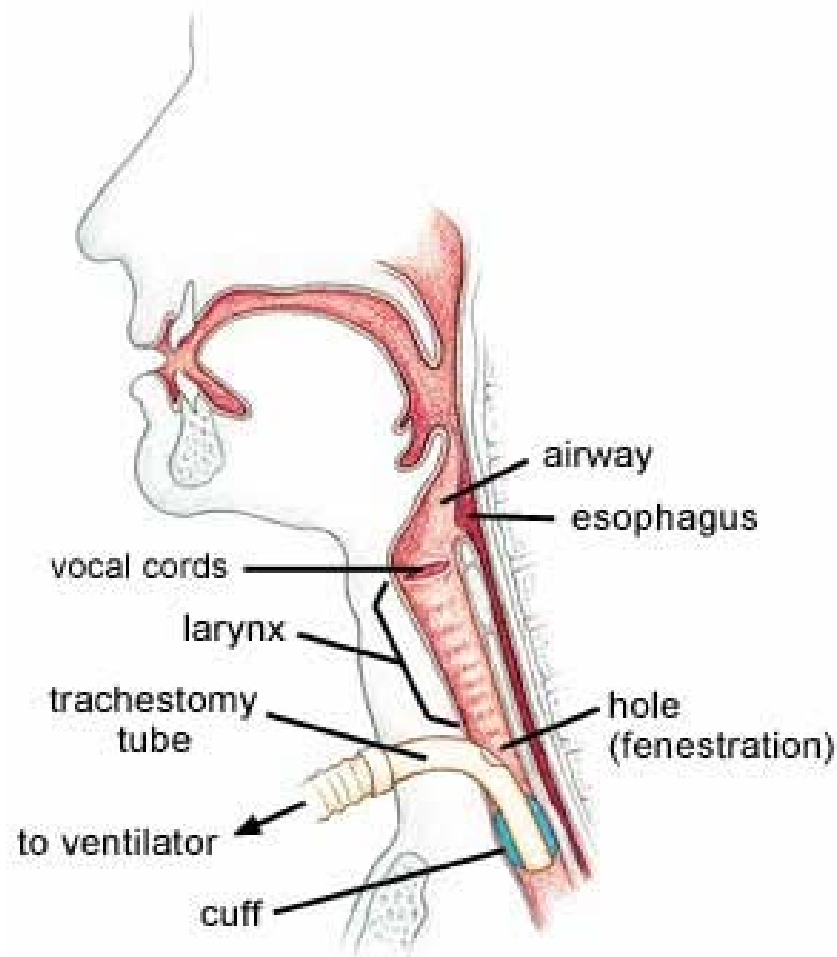


Technique for use suspected trauma



- Open airway
- Insert airway
- Immobilize head & neck
- Do not tilt head or neck!
- Ventilate

Bag to stoma or tracheostomy



Flow restricted, oxygen-powered ventilation devices



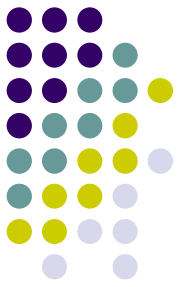
- Adults only
- 100% oxygen
- Use when no neck injury is suspected



Assisted Ventilation



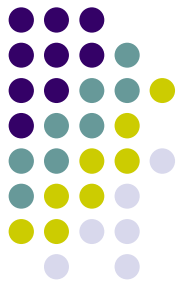
- Reduced minute volume- Ventilatory support
- Hyperventilation
- Hypoventilation



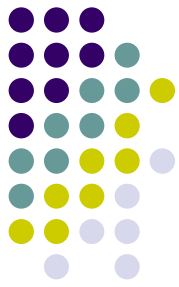
Special Considerations

- Patients with laryngectomies
- Infant and child patients
- Facial injuries
- Obstructions
- Dental appliances

Oxygen



- Oxygen cylinder sizes
 - a) D cylinder has 350 liters
 - b) E cylinder has 625 liters
 - c) M cylinder has 3,000 liters
 - d) G cylinder has 5,300 liters
 - e) H cylinder has 6,900 liters
- Care in handling



Oxygen use

Operating procedures

- Remove protective seal.
- Quickly open, then shut, the valve.
- Attach regulator-flowmeter to tank.
- Attach oxygen device to flowmeter.
- Open flowmeter to desired setting.
- Apply oxygen device to patient.
- When complete, remove device from patient, then turn off valve and remove all pressure from the regulator

Oxygen delivery equipment



- Nonrebreather mask
- Nasal cannula



Last words



**If you don't have an airway
you don't have a patient!
You have a cadaver!**